

Entry of the amendments is proper under 37 CFR §1.116 since the amendments: (a) place the application in condition for allowance (for the reasons discussed herein); (b) do not raise any new issue requiring further search and/or consideration (since the amendments amplify issues previously discussed throughout prosecution); (c) do not present any additional claims without canceling a corresponding number of finally rejected claims; and (d) place the application in better form for appeal, should an appeal be necessary. The amendments are necessary and were not earlier presented because they are made in response to arguments raised in the April 8 Advisory Action. Entry of the amendments is thus respectfully requested.

Applicant gratefully acknowledges that the Office Action indicates that claims 11 and 24 include allowable subject matter. Claims 11 and 24 are placed in independent form. Thus, at least claims 11 and 24 are in condition for allowance.

The attached Appendix includes marked-up copies of each rewritten claim (37 C.F.R. §1.121(c)(1)(ii)).

Reconsideration based on the following remarks is respectfully requested.

I. The Claims Define Patentable Subject Matter

The Office Action rejects claims 1-7, 15-17, 20 and 21 under 35 U.S.C. §102(b) over JP 09076282 (the 282 Patent); claims 25 and 26 under 35 U.S.C. §103(a) over the 282 Patent; and claims 8, 9, 12, 14, 18, 22, 27 and 30 under 35 U.S.C. §103(a) over the 282 Patent in view of JP 06177268 (the 268 Patent). These rejections are respectfully traversed.

The 282 Patent, whether alone or in combination with the 268 Patent, does not disclose or suggest a method of manufacturing a semiconductor device including, inter alia, applying a pressure in only one direction to a semiconductor assembly by at least one support pin so as to cause a stress in a lead frame, and sealing the semiconductor assembly with a resin injected into a cavity from a resin injection port of a mold, the stress caused in the lead

frame preventing the semiconductor assembly from being lifted up or pushed down by the resin when the resin is injected into the cavity, as recited in claim 1, and as similarly recited in claim 12. The 282 Patent, whether alone or in combination with the 268 Patent, also does not disclose or suggest a molding device for a semiconductor device including, inter alia, an actuator which moves a support pin in a direction of the axis of the support pin such that during injecting the resin into the cavity the support pin applies a pressure in only one direction to the semiconductor assembly so as to cause a stress in the lead frame, the stress caused in the lead frame preventing the semiconductor assembly from being lifted up or pushed down by the resin when the resin is injected into the cavity, as recited in claim 15.

Instead, the 282 Patent discloses a resin sealing molding method in which a semiconductor assembly is sandwiched by pressures applied in two directions by the holding members 10, 11.

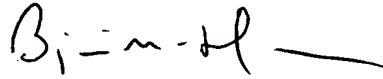
For at least these reasons, it is respectfully submitted that claims 1, 11, 12, 15 and 24 are patentable over the applied references. The dependent claims are likewise patentable over the applied references for at least the reasons discussed as well as for the additional features they recite. Applicant respectfully requests that the rejections under 35 U.S.C. §§ 102 and 103 be withdrawn.

II. Conclusion

In view of the foregoing, Applicant respectfully submits that this application is in condition for allowance. Favorable consideration and prompt allowance are earnestly solicited.

Should the Examiner believe anything further is desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact Applicant's undersigned representative at the telephone number listed below.

Respectfully submitted,



James A. Oliff
Registration No. 27,075

Benjamin M. Halpern
Registration No. 46,494

JAO:BMH/can

Attachment:
Appendix

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OLIFF & BERRIDGE, PLC
P.O. Box 19928
Alexandria, Virginia 22320
Telephone: (703) 836-6400

<p>DEPOSIT ACCOUNT USE AUTHORIZATION Please grant any extension necessary for entry; Charge any fee due to our Deposit Account No. 15-0461</p>

APPENDIX

Changes to Claims:

The following is a marked-up version of the amended claims:

1. (~~Three~~ Four Times Amended) A method of manufacturing a semiconductor device comprising:

placing a semiconductor assembly in which a semiconductor chip is secured to a die pad of a lead frame in a cavity of a mold;

applying a pressure in only one direction to the semiconductor assembly by at least one support pin so as to cause a stress in the lead frame;

sealing the semiconductor assembly with a resin injected into the cavity from a resin injection port of the mold, the stress caused in the lead frame preventing the semiconductor assembly from being lifted up or pushed down by the resin when the resin is injected into the cavity; and

pulling the support pin from the cavity into the mold before the resin is cured to release the semiconductor assembly from the pressure applied by the support pin.

11. (Twice Amended) ~~The method of manufacturing a semiconductor device as defined in claim 1,~~ A method of manufacturing a semiconductor device comprising:

placing a semiconductor assembly in which a semiconductor chip is secured to a die pad of a lead frame in a cavity of a mold;

applying a pressure to the semiconductor assembly by at least one support pin so as to cause a stress in the lead frame;

sealing the semiconductor assembly with a resin injected into the cavity from a resin injection port of the mold, the pressure applied by the at lease one support pin preventing the semiconductor assembly from being lifted up or pushed down by the resin when the resin is injected into the cavity; and

pulling the support pin from the cavity into the mold before the resin is cured to release the semiconductor assembly from the pressure applied by the support pin,

wherein the support pins is caused to come in contact with a suspension lead that connects the die pad to a frame of the lead frame.

12. (~~Thrice~~ Four Times Amended) A method of manufacturing a semiconductor device comprising the steps of:

supporting a heat radiator placed in a cavity of a mold with at least one support pin;

placing a die pad of a lead frame to which a semiconductor chip is secured on the heat radiator;

closing the mold;

applying a pressure in only one direction to the heat radiator by at least one support pin so as to cause a stress in the lead frame;

injecting a resin into the cavity from a resin injection port, the stress caused in the lead frame preventing the heat radiator from being lifted up or pushed down by the resin when the resin is injected into the cavity; and

pulling the support pin from the cavity into the mold before the resin is cured to release the heat radiator from the pressure applied by the support pin.

15. (~~Thrice~~ Four Times Amended) A molding device for a semiconductor device comprising:

a mold which is capable of being opened or closed and is provided with a cavity for placing a semiconductor assembly which comprises a semiconductor chip secured to a die pad of a lead frame;

a resin injection port provided to the mold for injecting a resin into the cavity;

at least one support pin provided in the cavity such that the support pin is able to enter into or be pulled out of the cavity to come in contact with the semiconductor assembly in the cavity; and

an actuator which moves the support pin in a direction of the axis of the support pin such that during injecting the resin into the cavity the support pin applies a pressure in only one direction to the semiconductor assembly so as to cause a stress in the lead frame, the stress caused in the lead frame preventing the semiconductor assembly from being lifted up or pushed down by the resin when the resin is injected into the cavity, and such that the support pin releases the semiconductor assembly from the pressure applied by the support pin after the resin is injected before the resin is cured.

24. (Twice Amended) ~~The molding device for a semiconductor device as defined in claim 15;~~ A molding device for a semiconductor device comprising:

a mold which is capable of being opened or closed and is provided with a cavity for placing a semiconductor assembly which comprises a semiconductor chip secured to a die pad of a lead frame;

a resin injection port provided to the mold for injecting a resin into the cavity;

at least one support pin provided in the cavity such that the support pin is able to enter into or be pulled out of the cavity to come in contact with the semiconductor assembly in the cavity; and

an actuator which moves the support pin in a direction of the axis of the support pin such that during injecting the resin into the cavity the support pin applies a pressure to the semiconductor assembly so as to cause a stress in the lead frame, the pressure applied by the at least one support pin preventing the semiconductor assembly from being lifted up or pushed down by the resin when the resin is injected into the cavity, and such that

the support pin releases the semiconductor assembly from the pressure applied by the support pin after the resin is injected before the resin is cured,

wherein the support pin is provided substantially on the axis of the resin injection port; and

wherein the support pin is placed at a position corresponding to suspension leads which connect the die pad to a frame of the lead frame.